

REMARKS/ARGUMENTS

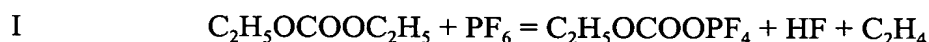
Claims 1-10 remain pending herein.

Claims 1, 2 and 9 were rejected under 35 U.S.C. §102(b) over Japanese 10-116631 (JP '631).

Claim 1 is amended as set forth above to recite that the negative electrode comprises graphitized carbon powder as the negative electrode active material. In JP '631, tin compound is used as the negative electrode material, different from the graphitized carbon powder used as the negative electrode material according to the present invention as recited in claim 1.

Accordingly, it is respectfully requested that the U.S. Patent and Trademark Office reconsider and withdraw this rejection.

In addition, the subject matter of claims 1-10 would not have been obvious in view of JP '631. In accordance with the present invention, the use of graphitized carbon powder as the negative electrode material, in contrast to the use of tin compound according to JP '631, is of important significance in the context of the present invention. During the course of charging and discharging cycles, the temperature of a battery including a lithium secondary battery is typically raised due to Joule heat caused by increase of internal resistance with such repeating charging and discharging cycles. Due to the temperature rise of the battery, the chemical reaction I set forth below, for example, is promoted and results in generation of HF.



The compound $\text{C}_2\text{H}_5\text{OCOOC}_2\text{H}_5$, carbonic acid ester, is present as the solvent of the non-aqueous electrolytic solution used according to the present invention. The compound PF_5 results from decomposition of LiPF_6 contained in the electrolyte. The above reaction is confirmed in the literature, e.g., "Journal of Power Sources", 104 (2002) 260-264.

The negative electrode material used in JP '631, namely, the tin compound, needs to be pulverized finely because of its specific large volume expansion and shrinking due to repeated charging and discharging cycles. Accordingly, the temperature of a battery in which tin compound is used as the negative electrode material is easily raised as compared with that of a battery in which graphitized carbon powder is used as the negative electrode active

material, as in the present invention. Accordingly, HF may be easily generated in the battery according to JP '631.

Neither JP '631 nor any of the secondary references, including Ejiri '577 contain any disclosure which would suggest the important favorable properties obtained according to the present invention through the use of graphitized carbon powder as the negative electrode active material.

Claims 3 and 4 were rejected under 35 U.S.C. §103(a) over JP '631 in view of U.S. Patent No. 5,807,646 (Iwata '646).

Iwata '646 is apparently relied on in the Office Action for alleged disclosure of lithium-manganese oxide. Accordingly, the alleged disclosure in Iwata '646 which is relied on in the Office Action fails to overcome the shortcomings of JP '631 as attempted to be applied against claim 1, from which claims 3 and 4 each ultimately depend. Accordingly, reconsideration and withdrawal of this rejection are requested.

Claims 5 and 6 were rejected under 35 U.S.C. §103(a) over JP '631 in view of U.S. Patent No. 5,792,577 (Ejiri '577).

The Office Action appears to rely on Ejiri '577 for alleged disclosure of graphitized carbon fibers. Accordingly, the alleged disclosure in Ejiri '577 relied on in the Office Action would fail to overcome the shortcomings of JP '631 as attempted to be applied against claim 1, from which claims 5 and 6 ultimately depend. Accordingly, reconsideration and withdrawal of this rejection are requested.

Claims 7 and 8 were rejected under 35 U.S.C. §103(a) over JP '631 in view of Iwata '646 and Ejiri '577. Iwata '646 and Ejiri '577 are apparently relied on in the Office Action for the disclosure discussed above. Accordingly, as discussed above, Iwata '646 and Ejiri '577 fail to overcome the shortcomings of JP '631 as attempted to be applied against claim 1, from which claims 7 and 8 each ultimately depend. Accordingly, reconsideration and withdrawal of this rejection are requested.

Claim 10 was rejected under 35 U.S.C. §103(a) over JP '631 in view of U.S. Patent No. 5,709,968 (Shimizu '968) or U.S. Patent No. 6,053,953 (Tomiyaama '953).

Shimizu '968 and Tomiyama '953 are apparently relied on for alleged disclosure of use of lithium batteries in electric automobiles. Accordingly, the alleged disclosure relied on in Shimizu '968 and Tomiyama '953 would fail to overcome the shortcomings of JP '631 as

attempted to be applied against claim 1, from which claim 1 depends. Reconsideration and withdrawal of this rejection are requested.

Claim 10 was rejected under 35 U.S.C. §103(a) over U.S. Patent No. 6,053,953 (Tomiyama '953) in view of JP '631.

Neither Tomiyama '953 nor JP '631 discloses or suggests a battery having the features recited in claim 1, including a negative electrode comprising graphitized carbon powder as the negative electrode active material.

It is respectfully requested that the U.S. Patent and Trademark Office reconsider and withdraw this rejection.

Claims 1-10 were provisionally rejected for obviousness-type double patenting over claims 1-8 and 12 of copending U.S. Patent Application Ser. No. 09/770,725 in view of JP '631, German 198 27 631 (DE '631) or WO 99/33471 (WO '471).

In view of the provisional nature of this rejection, the Applicants wish to defer consideration of this rejection.

In view of the above, claims 1-10 are in condition for allowance, subject to the provisional obviousness-type double patenting rejection.

If the Examiner believes that contact with Applicant's attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicant's attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,



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